



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,380	10/20/2003	Mark Beaumont	DB001072-000	3361

24122 7590 03/23/2006

THORP REED & ARMSTRONG, LLP
ONE OXFORD CENTRE
301 GRANT STREET, 14TH FLOOR
PITTSBURGH, PA 15219-1425

EXAMINER

CODY, DILLON J

ART UNIT PAPER NUMBER

2183

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/689,380	Applicant(s) BEAUMONT, MARK	
	Examiner Dillon Cody	Art Unit 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/20/03, 1/7/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-26 are pending.

Papers Filed

2. Examiner acknowledges receipt of claims, disclosure, drawings, declaration, and information disclosure statement, all filed 20 October 2003; information disclosure statement filed 7 January 2004; and preliminary amendment filed 12 October 2004.

Priority

3. Applicant's claim for foreign priority date of 23 April 2003 is hereby acknowledged.

Title

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

5. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because figures 2, 5, and 6A-10B contain labels and details which are not easily readable. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office

action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

6. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, generating and the initial count, current count, target count comparisons, incrementing/decrementing the current count, shifting data in the positive and negative "z" direction (from claim 7), and shifting data diagonally (from claims 15 and 19) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

8. Claims are objected to because of the following informalities:

Claim 9: It appears that "one of" should appear in line 1 after "additionally comprising". It would not make sense for a processing element to **both** have an initial count loaded into it AND generate the same initial count based on its location.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claim 13 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 12 recites either incrementing or decrementing the initial count to arrive at a current count. Claim 13 recites causing said selecting to occur when the current count

is non-positive. The specification does not enable one of ordinary skill in the art to increment an initial number until it is a non-positive number.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 26 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The memory device which this claim is directed toward is not limited to a tangible product. For instance, a piece of paper containing instructions reads on the claim in its current state. The examiner recommends amending claim language to read "Computer readable storage medium."

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-2, 5-11, 15-16, and 19-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor (U.S. Patent No. 4,992,933).

14. As per claim 1, Taylor teaches a method of controlling a plurality of processing elements, comprising: at least certain of said processing elements (Fig. 1 array controller 14) maintaining a count, each count being responsive to a processing element's location; and for each processing element maintaining a count, storing data in response to its count. *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue $1+n/2$ shift instructions (col. 10 line 18). The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

15. As per claim 2, Taylor teaches the method of claim 1 wherein said maintaining a count includes setting a counter to a first known value and altering the count at programmable intervals by a programmable amount, said storing occurring when a current count equals a target value. *The examiner asserts that in order to maintain a count, it must inherently be set to an initial value. Further, the examiner asserts that updating said count is inherent, as a count is useless unless it is updated on each iteration of the function it is counting. Data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

Art Unit: 2183

16. As per claim 5, Taylor teaches a method of controlling the data selected as output data by a plurality of processing elements, comprising:

issuing an instruction set to said plurality of processing elements, said instruction set being performed through a series of data shifts; (Col. 2 lines 42-48)

maintaining a count responsive to said data shifts within at least certain of said processing elements; *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

and selecting data based on said counts. *The examiner asserts that data is selected when the final shift has occurred.*

17. As per claim 6, Taylor teaches the method of claim 5 wherein said instruction set includes one of an edge shift, planer shift, wrap shift and vector shift or a combination thereof. *Figure 7b discloses a wrap shift.*

18. As per claim 7, Taylor teaches the method of claim 5 wherein said data shifts include shifting data in one of a north, south, east and west, plus z and minus z directions. *Figure 7b discloses shifting in the west direction.*

19. As per claim 8, Taylor teaches a method of controlling the position of data in a plurality of processing elements, comprising:

shifting data within the plurality of processing elements along one of a row, column or diagonal; *The examiner asserts that data is shifted along rows in fig. 7b.*

and each active processing element selecting data as a final output in response to that processing element's location within the plurality of processing elements. *The examiner asserts that final data is selected after the final shift has occurred. Each element maintains the data it has just received, based on its location in the array.*

20. As per claim 9, Taylor teaches the method of claim 8 additionally comprising loading an initial count into at least certain of said plurality of processing elements and calculating an initial count locally based on the processing element's location in the plurality and the function being performed on the data. *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue $1+n/2$ shift instructions (col. 10 line 18).*

21. As per claim 10, Taylor teaches the method of claim 9 additionally comprising maintaining a current count in at least certain of said plurality of processing elements, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that a current count is inherent to the loop control of Taylor's system. If a count were*

never updated on each iteration of the loop, the count would never increment or decrement, and the loop would never exit. The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.

22. As per claim 11, Taylor teaches the method of claim 10 wherein said initial count is modified by a programmable amount at programmable intervals to produce said current count. *The examiner asserts that Taylor's system is programmed to operate as disclosed. It is inherent that the count is programmed to update as per the requirements of the system.*

23. As per claim 15, Taylor teaches the method of claim 8 wherein said shifting includes shifting data north to south, south to north, east to west, west to east, northeast to southwest, southwest to northeast, northwest to southeast and southeast to northwest. *The examiner asserts that all these shift directions take place in the shift mapped in Fig. 7a. Diagonal shifts are accomplished by means of two shifts consisting of a vertical and a horizontal shift.*

24. As per claim 16, Taylor teaches a method for controlling the position of data in a matrix of processing elements, comprising:

shifting data within the matrix of processing elements; *Fig. 7a and 7b illustrate shifting data in the matrix.*

maintaining a current count in each active processing element responsive to the number of data shifts; *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue $1+n/2$ shift instructions (col. 10 line 18). The examiner asserts that the array controller constitutes an active processing element, as it keeps track of the count data for the entire array.*

and selecting output data as a function of said current count. *The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

25. As per claim 19, Taylor teaches the method of claim 16 wherein said shifting includes the north to south and south to north shifting of columns, the east to west and west to east shifting of rows, and the northeast to southwest, southwest to northeast, northwest to southeast and southeast to northwest shifting of diagonals. *The examiner asserts that all these shift directions take place in the shift mapped in Fig. 7a. Diagonal shifts are accomplished by means of two shifts consisting of a vertical and a horizontal shift.*

26. As per claim 20, Taylor teaches a method, comprising: shifting data within a plurality of processing elements; and each active processing element selecting data as

a final output in accordance with the formula $f(x_Index, y_Index, z_Index)$ where f is dependent upon the desired output. *The examiner asserts that the shifts outlined in Fig. 7a and 7b constitute data being shifted within a plurality of processing elements. The examiner further asserts that data is stored in response to the elements' locations: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift, dependent on their location in the shift scheme.*

27. As per claim 21, Taylor teaches the method of claim 20 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location and the function f . *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

28. As per claim 22, Taylor teaches the method of claim 21 additionally comprising maintaining a current count in each processing element, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that a current count is inherent to the loop control of Taylor's system. If a count were never updated on each iteration of the loop, the count would never increment or decrement, and the loop would never exit. The examiner further asserts that data is stored in response the count:*

when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.

29. As per claim 23, Taylor teaches a method, comprising: shifting data within a plurality of processing elements; and each active processing element selecting data as a final output in accordance with the formula $f(d(0), d(1), d(2) \dots d(n-1))$ where f is dependent upon the desired output. *The examiner asserts that the shifts outlined in Fig. 7a and 7b constitute data being shifted within a plurality of processing elements. The examiner further asserts that data is stored in response to the desired output: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift, dependent on their location in the shift scheme.*

30. As per claim 24, Taylor teaches the method of claim 23 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location and the function f . *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

31. As per claim 25, Taylor teaches the method of claim 24 additionally comprising maintaining a current count in each processing element, said current count being responsive to said initial count and the number of data shifts performed, said selecting

Art Unit: 2183

being responsive to said current count. *The examiner asserts that in order to maintain a count, it must inherently be set to an initial value. Further, the examiner asserts that updating said count is inherent, as a count is useless unless it is updated on each iteration of the function it is counting. Data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

32. As per claim 26, Taylor teaches a memory device carrying a set of instructions which, when executed, perform a method comprising: maintaining a count in at least certain of said processing elements, each count being responsive to a processing element's location; and for each processing element maintaining a count; storing data in response to its count. *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue $1+n/2$ shift instructions (col. 10 line 18). The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

Claim Rejections - 35 USC § 103

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2183

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

34. Claims 3, 4, 12-14, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor.

35. As per claim 3, Taylor teaches the method of claim 1 but fails to disclose wherein said maintaining a count includes setting a counter to an initial value, and counting down from said initial value, said storing occurring when a current count is non-positive.

36. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

37. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

38. As per claim 4, Taylor teaches the method of claim 1 but fails to teach wherein said maintaining a count includes setting a counter to a first known value, and counting up from said first known value, said storing occurring when a current count equals a target count.

39. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

40. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

41. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored value required by the NEWS setting to ensure the proper number of shifts was performed.

42. As per claim 12, Taylor teaches the method of claim 11 but fails to disclose wherein said modification includes one of incrementing and decrementing said initial count.

43. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

Art Unit: 2183

44. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

45. As per claim 13, Taylor teaches the method of claim 12 wherein said selecting occurs when said current count is non-positive. *The examiner asserts that zero is a non-positive value.*

46. As per claim 14, Taylor teaches the method of claim 12 wherein said selecting occurs when said current count equals a target value. *The examiner asserts that zero constitutes a target value.*

47. As per claim 17, Taylor teaches the method of claim 16 but fails to teach wherein said current count is incremented in response to said data shifts and said selecting occurs when a target value is reached.

48. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

49. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

50. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored

value required by the NEWS setting to ensure the proper number of shifts was performed.

51. As per claim 18, Taylor teaches the method of claim 16 wherein said current count is decremented from an initial count and said selecting occurs when said current count reaches a non-positive value.

52. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

53. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

Conclusion

54. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bratt et al. (U.S. Patent No. 6,877,020) disclose a matrix of processing elements performing various shift operations on the data in said elements.

Crozier (U.S. Patent No. 5,081,700) discloses a system for rotating an image by means of shifting data in an array.

55. The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon Cody whose telephone number is 571-272-8401. The examiner can normally be reached on Mon - Fri, 8 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 571-272-4162. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJC


EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100